I. Laboratory Director's Statement

As a member of the national laboratory system, Argonne has carried out world-class research and development for more than 55 years, addressing many of DOE's missions and most in the Office of Science. Our current programs focus on basic science, environmental quality and assessments, energy, and national security. Secretary of Energy Abraham has stated that national security is DOE's overarching mission. Argonne is well positioned to support this mission; much of our basic and applied research, though it is carried out in support of scientific and engineering missions, has application to homeland security.

To enhance our performance in carrying out DOE's missions, Argonne and the University of Chicago — which has operated the Laboratory for its entire history — are making good progress on a management initiative to strengthen their ties and to increase research collaborations between the two institutions.

National User Facilities

Over the decades, the national laboratory system has proven highly effective at planning, designing, building, and operating user facilities. These one-of-a-kind research engines help maintain and advance U.S. scientific leadership by providing crucial support for national communities of researchers in many fields. Argonne operates three of DOE's major national user facilities:

- The *Advanced Photon Source* (APS), Argonne's premier user facility, provides researchers with the nation's brightest x-ray beams. Built and operated for DOE's Office of Basic Energy Sciences, this facility serves the national research community in a broad spectrum of scientific and technological areas, including materials science, structural biology, environmental studies, and applied engineering. Collaborative access teams — composed of investigators from private industry, universities, government, and other institutions — have committed a quarter billion dollars in capital investments for construction of APS beamlines.

- The *Intense Pulsed Neutron Source* (IPNS) is widely known as one of DOE's exemplary user facilities, particularly because the machine and its operators embody the professional values of its national user community and serve the community's scientific interests. In the 20 years since its inaugural run, the IPNS has become a national model for user facility operations. The IPNS and its staff have committed their expertise to supporting the Spallation Neutron Source (SNS) project, soon to become the nation's premier neutron source, by designing and building instruments for the SNS and by training many of the future SNS users.

- The *Argonne Tandem-Linac Accelerator System* (ATLAS) is the world's first superconducting linear accelerator for heavy ions and the premier accelerator for low-energy nuclear physics research. In addition to supporting an active and productive community of physicists from all over the world, ATLAS plays a key role in Argonne's conceptual design for the Rare Isotope Accelerator.

Major Research Initiatives

To complement existing programs, Argonne works closely with DOE and the scientific community — often in a leadership role — to develop new initiatives and scientific facilities to serve national needs. The following five initiatives represent timely opportunities to significantly enhance U.S. research capabilities in basic research and development and hence to advance scientific understanding and engineering achievement across a wide range of disciplines:

- *Nanosciences and Nanotechnology*. Research on nanoscale materials will lead to devices such as computers that are smaller and more efficient and to materials with new and exciting properties. Argonne is well

positioned to contribute to these national goals and is actively developing regional collaborations to help the nation seize this important opportunity. One of the Laboratory's forefront research areas is nanomagnetism, in which electron spin controls current flow in a new generation of magnetic electronic devices. DOE has identified Argonne as one of its sites for a Center for Nanoscale Materials. The state of Illinois has appropriated $17 million of its FY 2003 budget for design and construction of a building to house the center, which will adjoin the APS and serve as a research and user outreach facility. Another $17 million will be sought in the FY 2004 budget to complete construction.

• *Rare Isotope Accelerator*. The Rare Isotope Accelerator (RIA) has been designated the highest priority among new construction projects for the physics community by both DOE's *Long-Range Plan for Nuclear Physics* and the National Research Council's Committee on Nuclear Physics. By accelerating highly unstable nuclei at the very limits of existence, RIA will open new scientific frontiers. Physicists will study the processes by which stars generate energy and create heavy elements, discover new and unexpected phenomena, and develop new approaches to studying nuclear decay, reactions, and structure. In collaboration with Michigan State University and other institutions, Argonne has developed a facility concept that achieves RIA's physics goals at reasonable cost by incorporating Argonne's existing state-of-the-art heavy-ion accelerator, ATLAS. The state of Illinois has appropriated $16.6 million of the $19.6 million planned for a user office building adjoining RIA.

• *Functional Genomics*. Recent developments in genome-wide DNA sequencing, high-throughput analytical tools, and computing technologies have made feasible the genome-wide analysis of biomolecular function. Such research could lead to new strategies for altering cellular activities to improve human health, environmental management, and economic productivity. It could also help DOE pursue its homeland security mission by deepening understanding of organisms used as biological warfare agents. To address this opportunity, Argonne is developing a major Laboratory initiative to undertake large-scale functional analyses of macromolecules and macromolecular complexes. The Laboratory is also strengthening its research staff in order to contribute to the latest developments in this fast-moving field. A partnership between Argonne's Biosciences Division and the Mathematics and Computer Science Division will coordinate the efforts of experimentalists and simulation experts to develop exciting new capabilities in bioinformatics and computational cell biology.

• *Advanced Computing*. Argonne has established an initiative in Petaflops Computing and Computational Science to spur development of petaflops computing and associated scientific applications. The computational science component will provide expertise and midrange computer resources so Laboratory research groups can begin to apply more advanced computational methods to their work and prepare for larger-scale computing opportunities. The R&D component will focus on designing and deploying a petascale system by 2006 and will support development of next-generation modeling capabilities in many scientific fields, including life sciences, nanoscience, energy systems, and the environment. The initiative envisions construction of a large-scale research facility to house a petaflops computing system and supporting programs in collaborative computational science research.

• *Advanced Nuclear Fuel Cycle*. We recognize that the U.S. industry initiative to simultaneously deploy five to ten economical new nuclear plants by 2010 must succeed, and we urge the government to provide adequate funding to leverage this critical initiative. Looking beyond the current industry initiative, widespread deployment of hundreds of large nuclear power plants cannot be achieved without meeting requirements for safety, economics, nuclear nonproliferation, sustainability, and reduced waste toxicity that expands repository lifetime and capacity. To meet these future needs, the nuclear industry must develop a closed fuel cycle. Argonne

proposes to collaborate with industry and other laboratories to develop and demonstrate such a fuel cycle, based on proliferation-resistant, fast-spectrum nuclear reactors.

The state of Illinois has provided extremely valuable support for Argonne's major research initiatives. This outstanding cooperation has fostered a very favorable environment for accomplishing the Laboratory's mission.

Management Initiatives

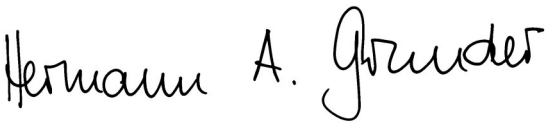
The most important measure of an organization is the quality and dedication of its people. We are pursuing a number of management initiatives to help maintain the high quality of Argonne's staff:

- *Review of Performance Appraisal System.* A team of senior Argonne staff has examined the Laboratory's system for evaluating employee performance. Although performance appraisal was the primary focus, career-development paths and the compensation system were also examined. The team obtained benchmark information from several DOE laboratories, collected "best practices" from other research organizations, and gathered employee input. The team's recommendations are now being implemented.

- *Making Optimal Use of the National Talent Pool.* To maintain high-quality staff, it is essential to attract the best qualified new employees from all ethnic and cultural backgrounds. Senior Argonne management recognizes the need to make better use of the nation's intellectual resources and is actively working to increase the diversity of the Laboratory's staff.

- *Integrated Management*. A key aspect of laboratory management is ensuring that line managers are responsible for achieving excellent performance in the full range of activities under their purview, including safety and security dimensions. At the same time, every employee must feel empowered to step up and stop work if he or she believes that safety or security is not adequately protected. This integrated management approach requires ongoing education and training of all staff.

- *Communications Synergy*. When communication flows unimpeded in all directions throughout an organization, the resulting interactions produce fertile synergies and great new ideas. We are making open communications a key part of the Argonne culture across all levels of management and staff. Open communication is necessary to ensure that line management learns of all available good ideas and can help implement them.



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